

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)	
)	
Petitions Regarding the Use of Signal)	WT Docket No. 10-4
Boosters and other Signal Amplification)	DA 10-14
Techniques used with Wireless Services)	
)	

**REPLY COMMENTS
OF THE NEW YORK CITY TRANSIT AUTHORITY**

The New York City Transit Authority (NYCTA) is providing reply comments to the Public Notice seeking comments on the petitions regarding signal booster/signal amplification techniques.

BACKGROUND / INTRODUCTION

NYCTA is the nation's largest provider of mass transit. Its extensive bus and subway operations provide service 24 hours each day, 7 days per week, 365 days per year to more than 7.6 million people each working day. The presence and reliability of NYCTA services are essential to the functioning of both the City of New York and its greater metropolitan region. NYCTA is the largest affiliated agency of the Metropolitan Transportation Authority (MTA) which, through its various affiliates and subsidiaries, provides mass transportation services via bus, subway, and commuter rail operations throughout the metropolitan region. One in three people who use mass transit in the United States do so on a bus, subway or commuter rail facility operated by one of the MTA agencies.

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Like all public safety entities, NYCTA is dependent on consistent, effective, and reliable wireless communications to perform its essential governmental functions.

NYCTA's subway radio communications system is considered to operate in one of the most challenging radio environments due to the fact that it provides radio communications coverage to over 880 track miles of the New York City underground subway system. Radio coverage is provided to underground NYCTA subway radio users by means of hundreds of radio devices connected to approximately 350 miles of radiating antenna cable infrastructure located along the tracks underground. Radio coverage outdoors is provided by use of traditional base stations and receivers employing standard land mobile radio antennas. NYCTA also provides underground radio service to the City of New York Police and Fire Departments via the use of signal booster technology consistent with 47CFR Part 90.219 Rules and Regulations. The Police and Fire system is comprised of base stations, Class A, and Class B devices configured to bi-directionally boost selected frequencies of its users.

NYCTA INSTALLATIONS
FULLY COMPLIANT WITH 47 CFR PART 90.219

NYCTA has installed and operates fixed signal boosters in the UHF (460-488 MHz) bands that are required for Police and Fire/EMS operations in the underground subway system with the authorization of its user agencies of the City of New York, the licensees. The NYCTA issued a Request for Proposal ("RFP") and selected a contractor to install multiple FCC compliant signal booster systems, known more commonly as Bi-Directional Amplifiers ("BDAs") throughout the NYCTA underground subway system using the already existing antenna infrastructure.

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The NYCTA BDAs only retransmit on the exact frequency(ies) consistent with 90.219(a). This is accomplished by having the air interface antenna located outdoors connected to Class A narrowband signal boosters on a per frequency basis, consistent with 90.219(b). Class B boosters are only utilized to boost the radio signals within several broader passbands or “frequency windows” once they have been selected via the Class A device. Both Classes of devices are compliant with the channel specific ERPs and have RF transmit power levels well below the maximum ERP of 5 watts. The devices, as configured, meet 90.219(c) for out of band emission limits. NYCTA has ensured compliance with 90.219(d) by only using Class B, broadband BDAs, for tunnels and underground areas and has not connected external antennas to these devices. The Class B devices only amplify the selected frequencies in the frequency windows. As stated above, NYCTA has been given authority by the City of New York to operate the signal booster system without separate authorization from the Commission and all devices are certificated and type accepted 90.219(e). No claim of interference to outside licensees has been made or reported as the only external interfaces are channelized Class A devices.

**ONLY LICENSEES AUTHORIZED
TO INSTALL OR AUTHORIZE USE OF DEVICES**

NYCTA concurs with comments submitted by APCO, CTIA, and many others that only the licensee should be able to implement and authorize the installation of signal booster technologies. Far too many instances of interference to Part 90 as well as commercial providers have been reported and investigated in the New York City area. NYCTA urges the Commission to clarify that signal boosters should not be purchased

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and installed without approval of the licensee to extend private radio systems (that are not licensed to the installing party). Many comments submitted to the Commission appear to urge that Class B devices be allowed to be installed for personal commercial wireless/cellular extensions, even if those installations have the potential for creating degrading effects. It would appear that many comments submitted to the Commission are from users which, in NYCTA's technical opinion, have installed Class B devices contrary to the Commission's existing Rules. Public agencies cannot tolerate any degrading effects to their systems and networks. Such devices have (or may have) deleterious effects on public safety agencies' abilities to communicate on their dedicated networks operating in the passband. NYCTA urges the Commission to clarify that Signal Booster devices cannot be operated on passbands or channels without the written consent of the licensees operating in the passband or specific channels.

**CLARIFICATION OF THE PROPER
APPLICATION OF CLASS A AND B DEVICES**

The underlying intention of the Commission's Part 90.219 rules would be well-served by the Commission's addition of specificity on the proper application of signal booster device types. NYCTA urges the Commission to retain the classification of channelized and broadband devices, Class A and B respectively, and to identify clearly the proper use of these devices in connection with this proceeding.

NYCTA recommends that the Commission consider the following for Part 90 signal booster application rules:

- Only Class A devices shall be used in the Radio Frequency (RF) link back to the infrastructure ("uplink") from a mobile user.

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- Class A or B devices can be used in the Radio Frequency (RF) link to the mobile user from the infrastructure ('downlink')
- Class B devices shall not employ external antennas that transmit Radio frequency signals
- The Class B bandpass does not need bandwidth limitations as its use is and should be limited to areas where the antennas/emitters are in isolated areas not in the outdoor environment.

NYCTA's rationale is based on the following:

- Part 90 licensees are assigned channel specific frequencies, not passbands
- Signal boosters typically have outdoor antennas to receive and transmit as if it were a fixed user (i.e. FX1 – control station)
- The retransmitted infrastructure signal ("downlink") is typically in an isolated area that does not have signals that can be received from the outdoors (*otherwise there would not be a need for a signal booster*)
- Part 90 mobile users only transmit on one frequency to the infrastructure whether using a conventional or trunked system; hence, the only signal that is to be transmitted back to the infrastructure would be channelized.

MOBILE USE OF SIGNAL BOOSTER TECHNOLOGIES

NYCTA recommends that the Commission only allow channelized signal boosters, Class A devices, for mobile use. These devices should only be operated on the actual frequencies of the licensee within their licensed authorized area of operation.

Mobile applications of Class A devices do not increase the potential for interference to users, other than regular co-channel licensees, which may already be subject to normal interferences experienced with mobile use.

Class B devices are not appropriate for and should not be employed for mobile use. These devices would amount to sources of roaming interference across the respective bandpasses affecting many licensees. To the extent that clarification is

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warranted, NYCTA would urge the Commission to take such action as may be necessary to clarify that mobile use of Class B devices is not authorized.

**NYCTA TAKES EXCEPTION TO CERTAIN
COMMENTS FILED BY BIRD TECHNOLOGIES GROUP**

Bird Technology Group (“BTG”) in its February 5, 2010 comments to the Commission, by referring to the NYC Subway System (p.4 of BTG comments), may have left an impression that NYCTA implemented “a P25 and other digital system(s)” and that “*excessive group delay became intolerable*”. NYCTA would like to clarify that it did not implement a P25 or digital system and does not agree with BTG’s statements. In connection with a specific project, NYCTA did have an issue with overlapping areas where the multipath delay of an incident signal and retransmitted signal created area(s) of audio interference. NYCTA refers to this situation as Time Domain Interference (TDI). In order to set the record straight, it should be noted that NYCTA has been working with its equipment provider to reach a solution by balancing the group delay of the device to mitigate the TDI effects to the user. In fact, the latest revision of the channelized device equipment made by the equipment provider, appears to be providing low group delay without affecting other channelized parameters.

BTG further describes industry trends in the development of “*newer ‘Channelized’ booster designs using digital signal processing (‘DSP’)*” (BTG Submission, pp.4-5) and urges that distinctions between Class A and Class B devices should be eliminated. BTG’s comments concerning the future of these hybrid devices should have no bearing on the current need for the Commission to clarify, to the extent necessary, the appropriate uses and applications of each type of device. Definitions of

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both classes should be retained for the foreseeable future. To the extent that the DSP devices are hybrids of Class A and Class B devices, the hybrid's configuration and use should determine its Class. These types of devices may well offer the industry the most flexibility as technology migrates to a more Software Defined Radio (SDR) modality and the trends for SDR devices are consistent with technology trends for voice and data. At the same time, however, scrapping the distinctions for Class A and Class B devices are not warranted at this time.

RECOMMENDED REGISTRY OF SIGNAL BOOSTER DEVICES

NYCTA is one of many agencies in the United States that has experienced interference on its systems. The only source for locating suspect transmitters has been the Commission's Universal Licensing System (ULS). The ULS does not have any information on signal boosters, as present rules do not explicitly require it. If such devices are to be used in outdoor areas, NYCTA would recommend that the Commission consider a registry of such signal boosters on ULS, identifying their locations, point of contact, and technical parameters which must include frequencies being transmitted, including band passes. Because of the potential for interference with critical public safety communications, use of the registry should not be optional.

SUMMARY

Signal Boosters are a valuable tool that, when used correctly, benefit its users.

NYCTA urges the Commission to (1) affirm that operation of signal boosters can only be done by the licensee or with expressed written permission of the licensee; (2) clarify its rules on the proper application of these devices as described in our reply comments; (3) retain the distinction of Class A and B devices; (4) allow use of only Class A devices for mobile operation; and (5) create a registry of Signal Boosters in the ULS.

Respectfully submitted,

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